

What is claimed is:

1. An in-vehicle control device for a vehicle, the in-vehicle control device comprising:

a control module that is modularized to control operation of the entire in-vehicle control device;

a detachably installed communication module that is detachably connected to the control module through a communication module interface and is modularized to communicate with an external communication network; and

a detachably installed vehicular I/O module that is detachably connected to the control module through a vehicular I/O module interface and is modularized to communicate data with an in-vehicle LAN of the vehicle, wherein:

the control module includes:

at least one universal function that is universal to the detachably installed communication module and at least one replaceable communication module, wherein each replaceable communication module is replaceable with the detachably installed communication module and uses a communication method that is different from a communication method of the detachably installed communication module; and

at least one universal function that is universal to the detachably installed vehicular I/O module and at least one replaceable vehicular I/O module, wherein each replaceable vehicular I/O module is replaceable with the detachably installed I/O module and meets an in-vehicle LAN standard that is different

from an in-vehicle LAN standard met by the detachably installed vehicular I/O module;

the detachably installed communication module has at least one nonuniversal function that is not universal to the detachably installed communication module and the at least one replaceable communication module;

the communication module interface is universal to the detachably installed communication module and the at least one replaceable communication module;

the detachably installed vehicular I/O module has at least one nonuniversal function that is not universal to the detachably installed vehicular I/O module and the at least one replaceable vehicular I/O module; and

the vehicular I/O module interface is universal to the detachably installed vehicular I/O module and the at least one replaceable vehicular I/O module.

2. The in-vehicle control device according to claim 1, wherein the control module has a control module circuit board that includes a dedicated radio communication device installation arrangement, which is adapted to receive and to operably connect with a radio communication device.

3. The in-vehicle control device according to claim 1, wherein the control module has a control module circuit board that includes a dedicated GPS receiver installation arrangement, which is adapted to receive and to operably connect with a GPS

receiver.

4. The in-vehicle control device according to claim 1, wherein the detachably installed communication module is operably connectable to a plurality of cellular phones, which use different communication methods, respectively.

5. The in-vehicle control device according to claim 1, wherein the control module and the detachably installed communication module are received in a single housing.

6. The in-vehicle control device according to claim 1, wherein:

the detachably installed communication module transmits identification information, which identifies the detachably installed communication module, to the control module when the detachably installed communication module receives an identification information request from the control module; and

the control module analyzes the identification information of the detachably installed communication module and thereby identifies the detachably installed communication module when the control module receives the identification information from the detachably installed communication module.

7. The in-vehicle control device according to claim 1, wherein:

when the detachably installed communication module

receives an instruction from the control module, the detachably installed communication module determines whether it is possible to respond to the instruction and transmits a reply to the control module when it is determined that it is possible to respond to the instruction; and

when the control module receives the reply from the detachably installed communication module, the control module analyzes the reply of the detachably installed communication module and thereby identifies the detachably installed communication module.

8. The in-vehicle control device according to claim 1, wherein:

when the detachably installed communication module receives an instruction list request from the control module, the detachably installed communication module transmits an instruction list to the control module, wherein the instruction list indicates at least one executable instruction, which is executable by the control module; and

when the control module receives the instruction list from the detachably installed communication module, the control module analyzes the instruction list received from the detachably installed communication module and thereby identifies the detachably installed communication module.

9. The in-vehicle control device according to claim 1, wherein the control module analyzes a combination of signal lines of the

vehicular I/O module interface and thereby identifies the detachably installed vehicular I/O module.

10. The in-vehicle control device according to claim 1, wherein:

when the detachably installed vehicular I/O module receives an identification signal from the control module, the detachably installed vehicular I/O module transmits a reply to the control module through two or more signal lines of the vehicular I/O module interface; and

when the control module receives the reply from the detachably installed vehicular I/O module, the control module analyzes a combination of the signal lines of the vehicular I/O module interface, through which the reply is transmitted from the detachably installed vehicular I/O module, and thereby identifies the detachably installed vehicular I/O module.